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MODELING OF THE NON-AUDITORY RESPONSE TO BLAST OVERPRESSURE

VU Program Guide - Version 1.6

ANNUAL/FINAL REPORT

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Michael J. Vander Vorst

JANUARY 1990

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ABSTRACT

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Unannounced	☐
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Availability Codes	
Avail and/or	
Dist Special	

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1. VU PROGRAM

The VU program provides interactive access to either the DASA created data files or a database of the processed data.

The user must communicate to the VU program the type of devices that are in use. This is done through a file named VU.CNF which the VU program reads during initialization. The format of the file is as follows:

Line No.	Description	Format	Example
1	Device driver for graphics card	(A15)	HALOIBME.DEV
2	Device driver for printer	(A15)	HALOEPSN.PRN
3	Specify font	(A15)	HALO104.FNT
4	Graphics mode (I2 format)	(I2)	^4
5	Color choices If any value other than default the user must follow with a line of color choices. The format is (6I5) and the colors indicated specify foreground, background, viewport border, and text colors.	(A15)	DEFAULT

Default values are

IFGD = 0 (black)   foreground
IBGD = 7 (grey)   background
ITCL = 0 (black)   text
IHCL = 12 (red)   wait message
INCR = 9 (cyan)   heading text
IBDR = 1 (blue)   viewport border

6	Interrupt number and locater	(I2, A15)	^KEYBOARD

The user must be sure the device drivers specified have been obtained from the HALO diskettes.

The device driver required to use the keyboard as a locater/cursor must be executed before running the VU program. The command is HALOKBDI.COM -I4. The file RUNVU.BAT can be executed to load the device driver and run VU.

The program is executed with the command VU.

Each level of the program is controlled by a menu which appears on the top three lines of the screen. A tree representation of the program flow is shown as Figure 1.

The first line on the screen describes the current function. Line 2 displays the various choices available with this function. As the user traverses the choices with the left and right arrows, the description of the current choice appears on line 3. A choice is made by either pressing the key which corresponds to the capitalized letter of choice, or hitting "return" when the choice is highlighted. The escape key can be used to return to last level of menu at any time.

1.1 VU MENU

The first screen which appears offers the following choices.

WRAIR Experimental Data Reduction			
Files	Calculate	Plot	Exit
Access to Disc Files			

The choices are described below.

1.2 FILES

The Files option allows the user to access disk files. When this is chosen the following menu appears.

Specify File Type				
DASA	dataBase	List	diRectory	Quit
File is in DASA format				

1.2.1 The DASA Option

The DASA option will request the user to provide the path name under which the EXPERIM.DAS directory will be found. The path given will be assumed to have the standard structure for files as described in DASA Tech Note #8, Application Note #3061, 13 Nov 1985. This directory will be read and the files in the first subdirectory will be listed. The user may choose a RAW data file to be processed by moving the highlighted field with the up and down arrows and, striking return at the appropriate name. The options of moving to the next subdirectory or terminating the file read process are also available.

2
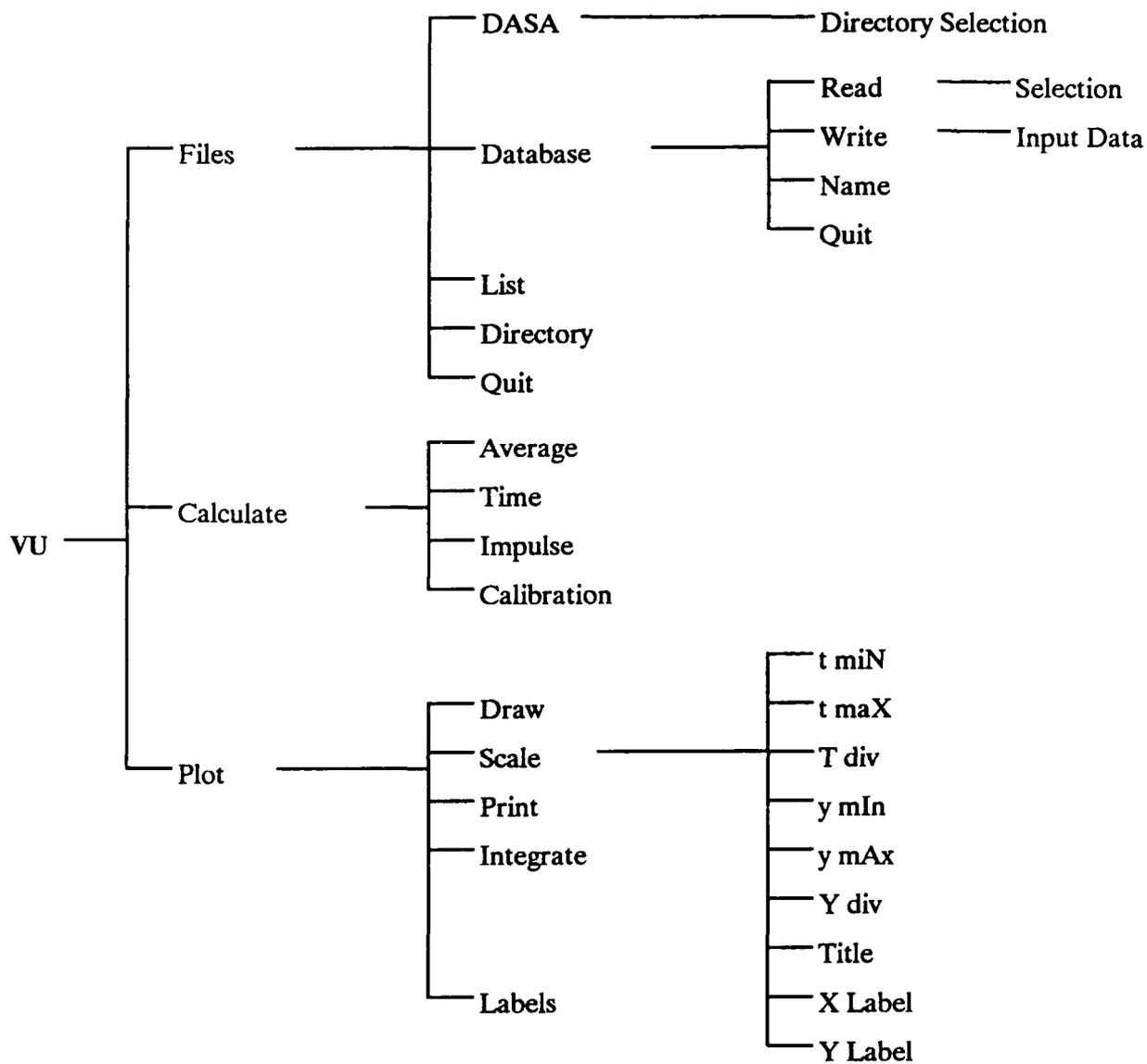
Figure 1. Tree representation of VU Program.

1.2.2 **The dataBase Option**

If the dataBase option is chosen, the next menu will offer the choice of reading, writing or specifying the name of the database file.

```
File Manipulation
Read          Write          Name          Quit
Read File from Disc
```

When the Read option is chosen, the user is presented with a list of the shots which are available in the database. When a shot is chosen, the subjects which pertain to that shot are listed. A shot or subject is chosen using the up or down arrows, and striking return when the desired file is highlighted.

The Write option will output the data currently in memory to the selected database. The user will be prompted for data fields required by the database.

General information required for each shot is listed below.

Prompt	Sample Response
Type of explosive	C-4 sphere
Weight of explosive	3.0 lb
Height of blast	4.0 ft

In addition, each location will request the following data.

Prompt	Sample Response
Location description	South Freefield
Distance	16.2 ft

When the database is initialized the user is allowed to define up to five additional fields which are location dependent. Input for these fields will also be solicited at this time. Section 2 describes initialization of the database. The information provided in these fields will be used to search the database. Therefore a standard set of responses should be established before entering data into the database.

The Name option is available to select a new database previous to a Read or Write command.

1.2.3 **The List Option**

The List option gives a list of files which exist on a user specified directory.

1.2.4 **The diRectory Option**

The diRectory option allows the user to specify a path name for DASA input files.

1.3 CALCULATE

The Calculate option allows manipulation of the raw data. The following set of options will be offered.

Calculation of Data				
Average	Time	Impulse	Calibration	Quit
Time Average data				

1.3.1 <u>Average</u>

Average will select the number of raw data points to be averaged and plotted and saved as one data point.

1.3.2 <u>Time</u>

Time will choose a time frame of the raw data to be displayed and saved.

1.3.3 <u>Impulse</u>

Impulse will calculate and display the impulse and duration data.

1.3.4 <u>Calibration</u>

Calibration will prompt the user to input the factor to be used to convert the data from volts to psi or G.

1.4 PLOT

The Plot option allows the user to plot current data to screen or printer. The data may also be integrated. Options to alter scales and labels are also available.

| Plot Data					
Draw	View/Change	Print	Integrate	Cursor	Quit
Plot current data					

1.4.1 <u>The Draw Option</u>

The DRAW option displays the data currently in memory on the screen.

1.4.2 The View/Change Option

The View/Change option offers the menu shown below with plotted data.

```
View/Change Scaling and Labeling
 Plot          Integral          Labels          Quit
 View/Change scales Plot
```
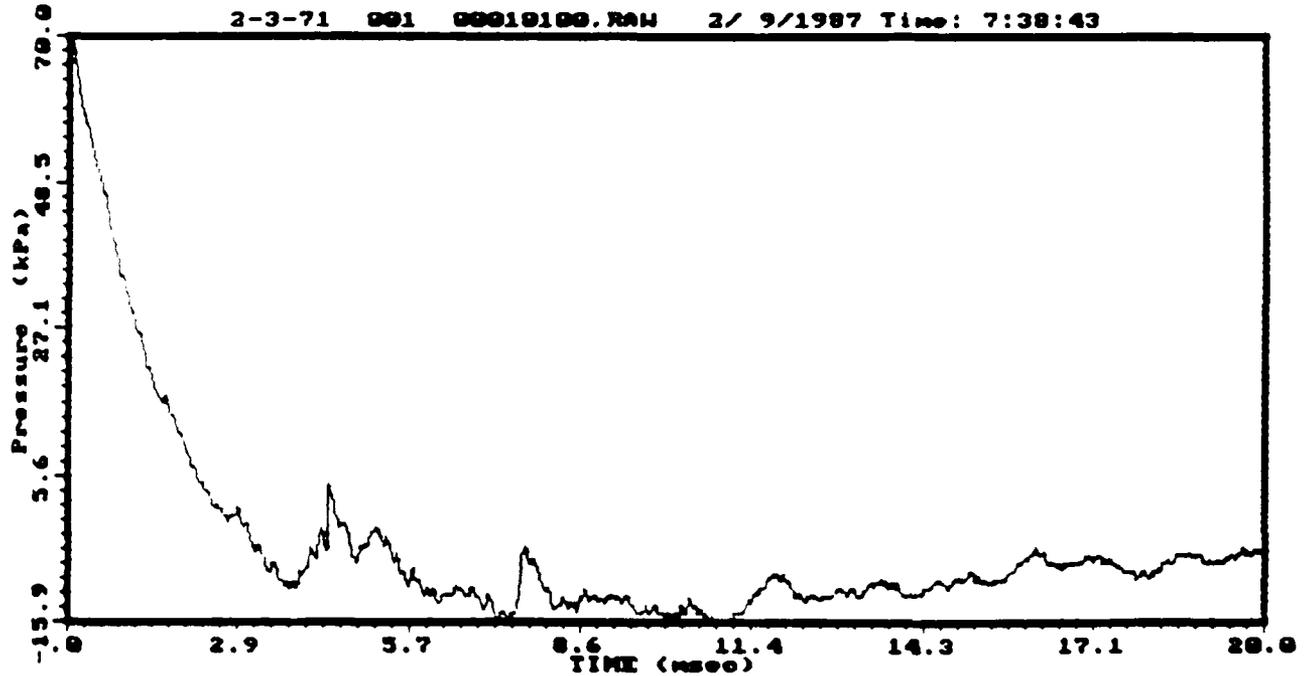

The choices allow the user to change plot scaling and labeling.

When Plot is chosen the menu shown below is displayed. This allows the user to change the parameters for the plot. The minimum and maximum values for either the time or Y axis scales. (Changes to Y values do not affect plots of the integral.)

The default values are the calculated minimum and maximum values of the data.

```
View/Change Scaling for Plot
 t miN      t maX      T Div      y mIn      Y max      Y Div      Quit
 Change time increment
```

6

2-3-71   001   00010100.RAM   2/ 9/1987 Time: 7:38:43
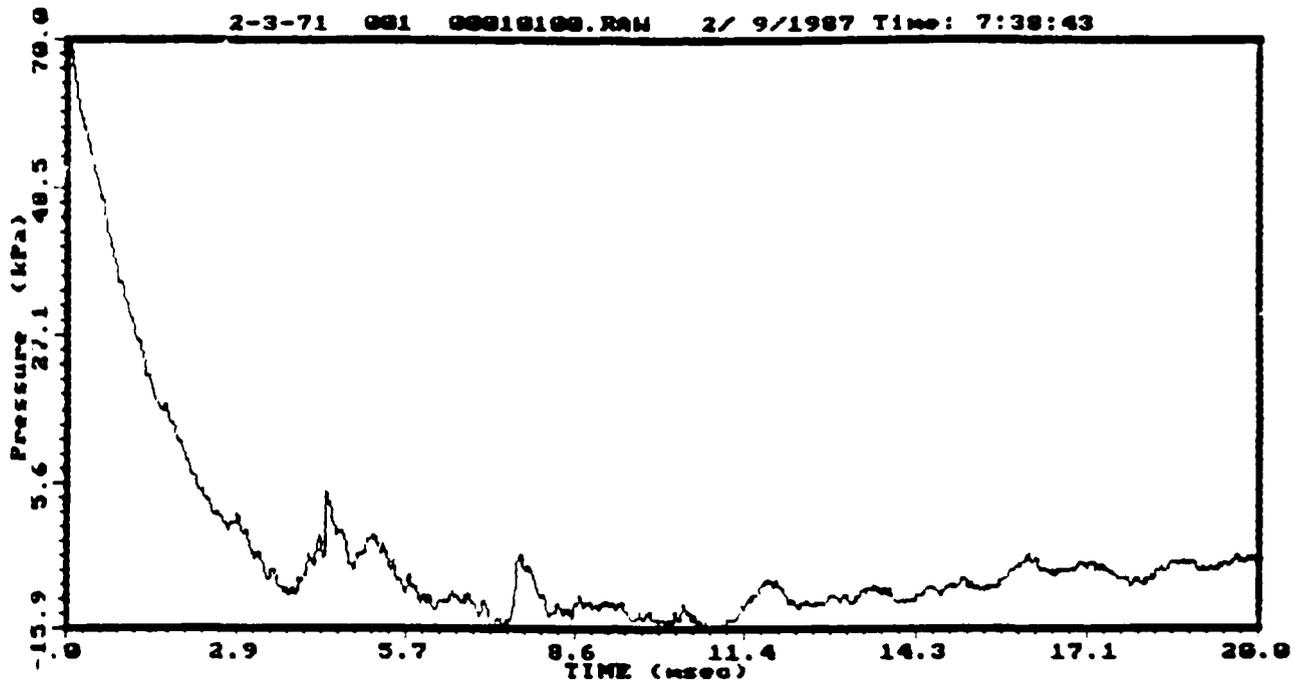
The Integral option provides the same capability for the plots of integrals. A sample screen and integral plot are shown below.

Displacement and Velocity Scaling

v miN	v maX	v Div	d mIn	d mAx	d Div	Quit

Change time increment

2-3-71   001   00010000.RAM   2/ 9/1987 Time: 7:38:43
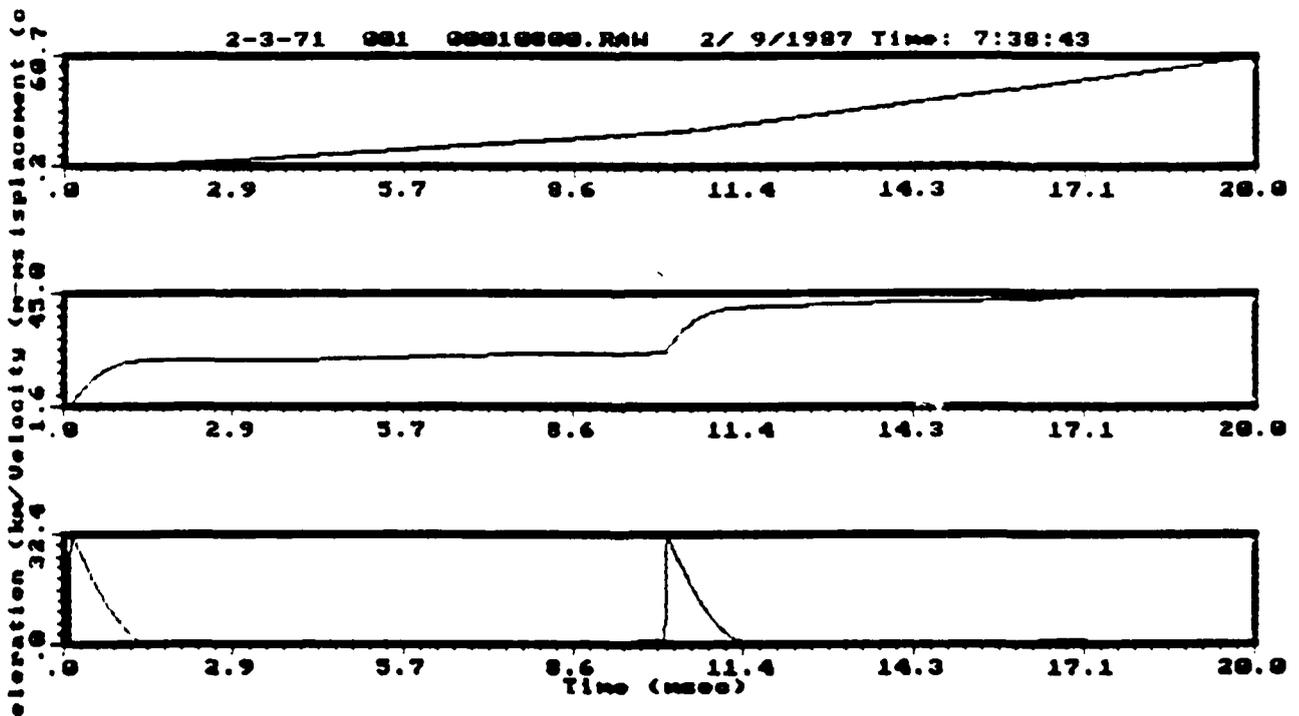
The Label option allows the user to override the default values for the title or the x or y axis labels. Default labels for the time axis will be TIME (msec). The y axis will be Pressure (kPa) or V. The menu for the Label changes is shown below.

Changes to Titles and Labels			
Title	X Label	Y Label	Quit
New X axis label			

1.4.3 **The Print Option**

The Print option puts the current plot on the printer.

1.4.4 **Integrate**

Integrate will produce a plot of the integrated data.

1.4.5 **The Cursor Option**

The Cursor option provides a cross hair cursor. The cursor position is controlled by the left and right arrows on the number pad. The values of the time and Y axis at the cursor position are displayed on the screen. The cursor function is terminated with the escape (ESC) key.

1.5 **EXIT**

This option terminates the VU program.

2. DATABASE PROGRAMS

The program DBINIT is used to initialize a database. When run the header fields are created. The user is prompted to define up to 5 fields for the database. Each field description consists of 20 characters. When data is put into the database the user will be required to supply information for each of these fields for each shot location.

The program DBLIST will provide a listing of data currently in a selected database.

3. DESCRIPTION OF THE DATABASE FILE

The database file consists of 10 header records and up to 3200 data records. Each data record is keyed by the shot number, device number and channel number.

The first header record contains the following information.

NUMREC	Number of records in database.
MAXREC	Maximum number of records in database.
MAXCHL	Maximum number of channels = 8.
MAXDEV	Maximum number of devices = 4.
MAXSHT	Maximum number of shots = 100.
EXPLSV(MAXSHT)	12 character descriptor of explosive type for each shot.
CWGHT(MAXSHT)	8 character description of weight of explosive.
FNAME(MAXSHT)	12 character directory name of shot.
HOB(MAXSHT)	8 character description of height of blast for each shot.

Header record 2 contains the following information.

NREC(4,8,100)	Record number for each device, channel, shot.
DESC(5)	20 character description for each of 5 user defined fields.

Header records 3-10 are available for future use.

Each data record consists of the following fields.

Name	Description	Field	No.Of Bytes
SUBJCT	Name of subject (RAW filename)	A12	12
LOC	Description of location	A44	44
NPTS	Number of data points	I2	2
TSTART	Start time (msec)	F	4
DT	Time step (msec)	F	4
TUNITS	Time units	A10	10

Name	Description	Field	No.Of Bytes
YUNITS	y axis units	A10	10
VMIN	Minimum y axis value	F	4
VMAX	Maximum y axis value	F	4
NDEV	Device number	I2	2
NCHL	Channel number	I2	2
DIST	Not used	F	4
IWFR	Logical device	I2	2
TIME	Time of shot	A12	12
DATE	Date of shot	A12	12
CALIB	Conversion to psi or G	F	4
DURAT	Duration of impulse (msec)	F	4
AIMPLS	Impulse (kPa or G)	F	4
NODIR	Index to FNAME	I2	2
TDIV	Number of division times	F	4
YDIV	Number of divisions y	F	4
ID	Title	A80	80
FIELD(S)	User supplied fields	A20	100
XLAB	x label for graph	A40	40
YLAB	y label for graph	A40	40
VALUE(3000)	Data points	F	12,000

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